

# EARTH AND MINERAL SCIENCES

## About the College

Lee Kump, Dean, College of Earth and Mineral Sciences

For more than a century, Penn State's College of Earth and Mineral Sciences has been a beacon of intellectual leadership on issues of utmost importance to the welfare of the Commonwealth, the nation, and beyond. The college is creating tomorrow's leaders in Earth, energy, and materials sciences and engineering and plays an important role in preparing a diverse and talented workforce, as well as providing new knowledge that will drive the economic vitality of the state and the nation. With its top ranked programs and five academic departments, the college provides a comprehensive, high-quality education and is at the forefront of both innovative teaching and path-breaking research focused on meeting the needs of our global society.

Distinguished researchers and educators at the cutting edge of their disciplines are dedicated to supporting hands-on learning and research that provides each student with invaluable, experiential knowledge.

MORE INFORMATION ABOUT THE COLLEGE (<https://www.ems.psu.edu/about/>)

## Mission and Goals

By building on its reputation for scientific leadership in the earth, energy, and materials sciences and engineering, the College of Earth and Mineral Sciences' mission is to develop new discoveries about how the Earth's systems interact with one another and with people and their institutions and to use the knowledge gained from those discoveries to inspire students to become new generations of leaders.

MORE INFORMATION (<https://www.ems.psu.edu/about/who-we-are/mission-vision-and-strategic-plan/>)

## Departments and Schools

### John and Willie Leone Family Department of Energy and Mineral Engineering

The John and Willie Leone Family Department of Energy and Mineral Engineering offers academic programs addressing scientific, technological, business, and social challenges related to energy and earth resources and systems. The EME undergraduate B.S. majors address the effective production, conversion, use, and management of energy and mineral resources and include Energy Business and Finance (EBF), Energy Engineering (ENENG), Environmental Systems Engineering (ENVSE), Mining Engineering (MNGE), and Petroleum and Natural Gas Engineering (PNGE). The EME graduate program offers advanced degrees in Energy and Mineral Engineering (M.S. and Ph.D.) with research concentration options in energy system engineering (ESysE), fuel science (FSC), mining and mineral process engineering (MMPE), and petroleum and natural gas engineering (PNGE). The B.A. degree in Energy and Sustainability Policy (ESP) and graduate certificates and associated M.S. in Renewable Energy and Sustainability Systems (RESS) complement our programs by integrating areas of study in energy security, sustainability management, renewable energy, foreign and domestic energy and sustainability policy analysis. The EME graduate program also offers integrated undergraduate-graduate (IUG) degree

programs that combine the M.S. in Energy and Mineral Engineering with each of the five B.S. degree programs.

MORE INFORMATION (<http://www.eme.psu.edu/>)

### Department of Geography

The Department of Geography offers academic programs (M.S., M.G.I.S., Ph.D. in Geography) that conducts theoretical and applied research in all four major subfields of geography: human, physical, environment and society, and GIScience. Across these subfields we emphasize the geography of global change. Our perspectives span local to global levels across spatial and temporal scales. Addressing these components of global change, we also advance geographical information science and technology needed to use new spatial data generated from combinations of specialized sensors and the Internet of things. Research and specialization clusters include: Environmental Change and Prediction; Food Security and Human Health; Geospatial Big Data Analytics; Justice, Ethics, and Diversity; Population, Environment, and Governance; Spatial Modeling and Remote Sensing. The department also offers online certificate and master's degree programs in Geographic Information Systems (GIS), Remote Sensing and Earth Observation (RS), and Geospatial Intelligence (GEOINT).

MORE INFORMATION (<http://www.geog.psu.edu/>)

### Department of Geosciences

The Department of Geosciences offers M.S. and Ph.D. degrees in geosciences, dual titles in Astrobiology and Biogeochemistry, and an M.Ed. in Earth sciences all designed to provide students with an integrated, interdisciplinary study of the whole Earth, afford them with the skills and knowledge needed to solve real-world problems, and prepare them for careers at the forefront of geosciences.

MORE INFORMATION (<http://www.geosc.psu.edu/>)

### Department of Materials Science and Engineering

The Intercollege Graduate Degree Program in Materials Science and Engineering offers both M.S. and Ph.D. degrees in Materials Science and Engineering. Instruction covers both the fundamental science of materials and practical engineering applications. Students have the opportunity to learn in depth about one more families of materials, including biomaterials, ceramics, metals, nanomaterials, polymers, and semiconductors. There is also a doctoral minor in computational materials.

MORE INFORMATION (<http://www.matse.psu.edu/>)

### Department of Meteorology and Atmospheric Science

The Department of Meteorology and Atmospheric Science offers academic programs (M.S., Ph.D. in Meteorology and Atmospheric Science; dual-title Ph.D. in Climate Science; dual-title Ph.D. in Astrobiology) that explore fundamental aspects of cloud physics, turbulence, numerical weather prediction, climate change, weather risk, atmospheric chemistry, atmospheric convection, and atmospheric dynamics on a range of scales using theory, observations, and numerical simulations.

MORE INFORMATION (<http://www.met.psu.edu/>)

## Resources

### Office of Educational Equity

Diversity among students and faculty is a top priority for the College of Earth and Mineral Sciences and the Office of Educational Equity takes an active role in promoting respect and embracing diversity and inclusion in the college.

MORE INFORMATION (<https://www.ems.psu.edu/undergraduate/beyond-classroom/diversity-programs/>)

## Contact

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